wave warning was issued on the 29th, which was fully justified. A cold wave passed over this section on the 13–14th for which no warnings were issued, although the forecasts announced "colder weather" for all sections of the district. There were no gales along the coast for which warnings were not issued.—*J. W. Smith, District Forecaster.*

CHICAGO FORECAST DISTRICT.

Several energetic storms crossed the Great Lakes, the severest of which reached the Lakes on the 28th, causing an unusually large number of wrecks. Wrecks also occurred during previous storms of the month. Warnings were issued well in advance of the gales.

From the 27th to 29th a cold wave overspread the entire district. Timely advices were issued of the approaching cold, and on the 27th forecasts of heavy snow were made for the Dakotas, Minnesota, and Montana.—*H. J. Cox, Professor and District Forecaster.*

LOUISVILLE FORECAST DISTRICT.

Six general disturbances materially affected the weather conditions of this district, of which two caused severe storms on the 23d, 24th, 28th, and 29th, the latter being followed by the first cold wave of the season.—*F. J. Walz, District Forecaster.*

NEW ORLEANS FORECAST DISTRICT.

Storm warnings were issued for the west Gulf coast on the 29th, and high winds occurred at many points.

Frost warnings were issued twice in the first decade of the month for Arkansas and northern Louisiana, and frosts occurred in each instance over a great portion of the territory indicated. Warnings for freezing temperatures were issued on the 28th for Oklahoma and the Texas panhandle, and cold-wave warnings were ordered on the 29th for Arkansas, northern Louisiana, and the interior of Texas, the warnings in each case being verified.

In commenting on the cold weather and the warnings issued in connection therewith, the Daily States, of November 30, 1905, says:

> The forecasts and warnings of the United States Weather Bureau service in connection with this cold weather have been exceptionally accurate, both as to the intensity of the cold and the time of its occurrence. The money value of such a warning service is beyond computation.
>
> *I. M. Cline, District Forecaster.*

DENVER FORECAST DISTRICT.

The most important weather changes of the month occurred in connection with a disturbance that crossed the district on the 27th and 28th, and timely warnings were issued for the cold wave that followed the disturbance.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

The first half of the month was abnormally dry and during the last half several barometric depressions were attended by general rains.—*A. G. McAdie, Professor and District Forecaster.*

PORTLAND FORECAST DISTRICT.

There were two stormy periods, one from the 17th to 20th, and the other from the 25th to 30th, the heaviest winds occurring on the 17th. Warnings were issued on the 27th for the cold wave that overspread the district on the 28th.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

The only floods of the month occurred in the Gila, Salt, and lower Colorado rivers in southern Arizona. No river and flood service is maintained in this section, and no detailed reports of the floods have been received. From press reports, however, it has been learned that the floods were the greatest since 1891, when the southern portion of the city of Phoenix was inundated by flood waters from the Salt River. The floods were caused by the heavy rains and snows that fell over Arizona on November 26 and 27. The rains had been preceded by heavy snows in the Verde and Salt watersheds, and these snows, melted by the warm rains, were doubtless the principal factors in the flood formation. It was reported that the Arizona dam near Phoenix was greatly damaged, as were also numerous irrigation works, and several bridges were either badly injured or carried entirely away.

The lower Colorado River was also in flood a day or two later, and in the vicinity of Yuma was higher than any time since 1891 when the floods were somewhat more severe throughout the Colorado watershed. The only damage done at Yuma was the flooding of the electric lighting plant, the levees having been kept intact by a vigilant patrol. The Imperial Irrigation Works was reported as practically destroyed, and hope of diverting the river back to its old channel was abandoned.

There was somewhat less ice during the month than during the corresponding period of the previous year. Slush ice first appeared in the Missouri River at Bismarck, N. Dak., on the 1st, but the river did not freeze over until the 28th when navigation was suspended. In the lower river slush ice was running as far as Omaha, Nebr., on the 30th.

No ice of consequence was observed in the Mississippi River south of Minnesota, although it was quite heavy on the 26th and 27th at Reeds Landing, Minn.

The highest and lowest water, mean stage, and monthly range at 273 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*

CLIMATE AND CROP SERVICE.

By Mr. JAMES BERRY, Chief of Climate and Crop Divison.

The following summaries relating to the general weather and crop conditions during November are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau; they are based upon reports from cooperative observers and crop correspondents, of whom there are about 3300 and 14,000, respectively:

Alabama.—Generally dry, mild, and favorable for work. Many warm days, but several moderately cold periods. Temperature reached 20° in northern counties on the 29th and 30th. Gathering of cotton and corn practically completed by the 20th, though a little cotton was still outstanding in scattered localities at close of month. Corn and minor crops made satisfactory yields, though quality of corn was inferior in many localities. Fall plowing and seeding progressed slowly. Early sown wheat and oats made good stands.—*F. P. Chaffee.*

Arizona.—The average temperature for the Territory was 1° below the normal; the average precipitation 3.99 inches in excess. Killing frost on the 28th, 29th, and 30th damaged gardens. Floods in the Salt and Gila rivers washed farm lands and roadways and carried away bridges. Much wheat and barley were sown; early planted growing well. Seventh and last cutting of alfalfa completed. Oranges, grape fruit, and dates yielding largely. Ranges much improved by new growth of grass. Stock in excellent condition. Water supply plentiful.—*L. N. Jesunofsky.*

Arkansas.—The month was generally favorable for farm work and the growth of late crops. Plowing for spring crops was delayed in some localities by the wet condition of the ground. Cotton picking was about completed, and the crop secured in fair condition. Wheat, oats, and rye were up to good stands. Irish and sweet potatoes made good yields. Fruit buds were too far advanced.—*C. M. Strong.*

California.—The heavy rainfall in southern California at the beginning of the month, and throughout the greater part of the State from the 26th to the 30th, caused a marked improvement in farming conditions generally. The seasonal rainfall was still far below average except in the south, but in most places the precipitation had been sufficient to soften the soil and start pasturage. The snowfall in the mountains was quite

heavy for the period. Severe frosts and high winds during the month caused but little damage.—*Alexander G. McAdie.*

Colorado.—The weather conditions were generally favorable to grass, farming operations, and the gathering of outstanding crops. Ranges were in good condition and stock water was adequate. The condition of cattle, horses, and sheep was generally good.—*Fred. H. Brandenburg.*

Florida.—The month gave nearly the normal amount of warmth. There was a deficiency in precipitation exceeding an inch. The month was one of the driest in the history of the section, being surpassed only in 1892, 1899, and 1901. The dry weather proved rather disastrous to vegetables on highlands. Much replanting and transplanting were necessary. The absence of rain was favorable for cane grinding and the harvesting of citrus fruits. Oats and rye did very well, although the lack of rain was seriously felt.—*A. J. Mitchell.*

Georgia.—The temperature was above and the rainfall below normal for the month, furnishing conditions favorable to the harvesting of crops, which work was practically completed. Minor crops showed satisfactory yields generally. Fall plowing was retarded in scattered districts by dry weather. The seeding of small grains progressed rapidly, as a rule, the seed germinating and growing nicely; acreage increased in some sections. Freezing temperatures extended well into the southern section.—*J. B. Marbury.*

Hawaii.—See addendum.

Idaho.—The month was the brightest November on record for Idaho, sunshine over a large part of the State having been almost uninterrupted by cloudiness during the first half of the month. Later in the month the weather became unsettled, and the month closed with stormy weather in all sections and heavy snow in the mountains. Some sheep were caught in the open range by the snow, but most wool growers were well prepared for rough weather.—*Edward L. Wells.*

Illinois.—Weather conditions were exceptionally favorable for farming operations, except in the southern district, where too much precipitation interfered with work. Wheat maintained a fine condition. The plant at the end of the month had attained good growth, was showing a good stand, had stooled well, and was altogether vigorous and healthy. In the central and northern districts the corn crop was mostly gathered during the month, with generally satisfactory results. Apples were very disappointing.—*Wm. G. Burns.*

Indiana.—Wet ground in some southern counties retarded corn husking and wheat seeding and probably caused a decreased acreage of wheat. Ungathered corn was down and damaged in some localities, but the greater portion of the crop had been cribbed in good condition or marketed. Old clover appeared dead in most fields and the stand of young clover was doubtful. Wheat and rye, generally, were in excellent condition. Hog cholera was prevalent in several localities.—*W. T. Blythe.*

Iowa.—The month was unusually favorable for harvesting the heavy corn crop, as there were sixteen clear days and only five on which rain fell. Probably over 80 per cent of the corn was cribbed in excellent condition before the close of the month; pasturage was very good, and there was sufficient moisture for healthy condition of fall wheat and rye; acreage of wheat much increased.—*John R. Sage.*

Kansas.—At the close of the month wheat presented a good stand, had a good color, and was growing well; in some of the northwestern counties wheat was still being sown. Corn husking was generally well advanced, though delayed more or less by the rains. The range in the western part of the state was generally good. Cattle were doing well.—*T. B. Jennings.*

Kentucky.—Month cool at opening, with moderate temperatures following. Another cool spell occurred about the 15th. Heavy rain occurred about 28th and 29th, followed by a cold wave on the 30th. Excepting the last two days, the month was favorable, with early sown wheat splendid and late sown coming up nicely. Fall rye and grass fine. Feed abundant and stock looking well. Corn mostly gathered and much husked. Fine potato crop, but tubers not keeping well.—*F. J. Walz.*

Louisiana.—Heavy rains over the southern and western portions of the State interfered to some extent with agricultural interests. Preparations for spring crops progressed slowly, except in scattered localities, where work was pushed vigorously. Sugar cane harvest progressed slowly and was backward; the tonnage was generally heavy, but the sugar yield was irregular. Rice thrashing, corn gathering, and cotton picking were about completed.—*I. M. Cline.*

Maryland and Delaware.—November was unusually dry, though the drought was relieved somewhat by rain at the close of the month. The temperature was seasonable. Fall work neared completion. Early sown grains and grasses did fairly well, but those put in late were starting poorly. Pastures failed extensively, but there was an abundance of silage and fodder. Final harvesting operations were nearly finished.—*C. F. von Herrmann.*

Michigan.—The month of November in the principal agricultural counties of the State was slightly cooler and drier than the normal. These conditions were generally very favorable for securing late fall crops. At the close of the month a large per cent of corn was husked and most of the sugar beets delivered to the factories. Winter wheat and rye made good growth, but considerable Hessian fly was reported in the early seeding of wheat.—*C. F. Schneider.*

Minnesota.—The mean temperature was everywhere above normal; the precipitation was also above normal, with heavy rains on the 4th and 24th, and heavy snow on the 27th. Very fine weather from the 9th to the 22d. No cold weather until late in the month, and lakes not frozen until the 30th. Plowing, thrashing, and corn husking well advanced. Some Red River Valley wheat, abandoned because of high water at harvest time, was being cut during November.—*T. S. Outram.*

Mississippi.—Notwithstanding some heavy rains during the first decade, the weather was generally favorable for gathering crops. From the 14th to the 29th unusually warm weather prevailed, but on the 30th a cold wave swept over the State, giving freezing temperature almost to the coast. Cotton picking was practically completed, except in the western counties, where about one-tenth of the crop was unpicked at the close of the month. Corn was all housed. Very little fall seeding, but considerable plowing was done. Gardens did well south.—*W. S. Belden.*

Missouri.—The month of November was generally favorable for outdoor work on the farm and for the growth of wheat. The wheat crop was highly satisfactory at the close of the month as to stand, color, and growth. Corn gathering progressed favorably; about one-fourth of the crop was still in the fields, but was in shock and in good condition; the yield was satisfactory. Winter pastures continued in good condition and stock water was plentiful.—*George Reeder.*

Montana.—The month was mild and dry until the 23d. Light to heavy snows fell throughout the State the remainder of the month, with several days of intense cold. Range feed plentiful till covered by snow, and little feeding was necessary. Cattle, sheep, and horses were mostly strong and in good flesh, and were not seriously affected by the inclement weather. Too dry in some localities for fall wheat to germinate; most of the crop came up well, and was in excellent condition.—*R. F. Young.*

Nebraska.—November was warm and wet, unusually favorable for the growth of grass and fall sown grain. Pastures were good throughout the month and stock generally was in prime condition. Winter wheat made an excellent growth and was in fine condition, the early sown fields being rather the best. Corn husking was delayed by wet weather, but generally rather more than half the crop was gathered in November. The yield was less than expected.—*G. A. Loveland.*

Nevada.—The average temperature for November was 3.1° below normal, and the average precipitation was 0.32 inch above normal. The first half of the month was dry, but the drought was broken on the 19th, when rain or snow occurred; the remainder of the month was generally stormy, with heavy snows in the mountains. The precipitation greatly benefited wheat, oats, barley, and range grasses. Stock was generally in fair condition and large numbers were gathered to the ranches for winter feeding.—*H. F. Alps.*

New England.—The weather of the month was exceptionally pleasant, there being an unusually large percentage of sunshine and but few stormy days. The precipitation, while light, was well distributed, except some large amounts at points in Maine. The small rainfall of autumn left the ground very dry, and copious rains were much needed. Fall work and farming operations of all kinds made good grogress, the prevailing fair weather having been very favorable for all outdoor pursuits.—*J. W. Smith.*

New Jersey.—Exceptionally fine weather prevailed to the 28th. Farm work was well advanced. Wheat, rye, and grass were in fairly good condition, but in places the stands were impaired by drought and the crops were not sufficiently well rooted to withstand winter's freezing and thawing. Wheat sown late in October in the southern section was not yet above ground. Springs and streams were low, some dry. Copious rains at the close of the month effectually broke the long drought in northern and central sections.—*Edward W. McGann.*

New Mexico.—Exceedingly heavy rains fell in the valleys and over the mesa lands, and unusually deep snow in the mountain districts. The warm rains of the 26th and 27th melted the snow on the mountains in the southwest portion and caused a damaging flood along the Gila River. The weather was favorable to stock, except in some sections of the north, where the cold spell at close of month caused some shrinkage. The ranges were in good condition and grass plentiful. High winds were frequent and protracted.—*J. B. Sloan.*

New York.—November was a fine fall month, with generally mild temperature. The precipitation was generally light until the last three days of the month, when a fairly good amount of rain or snow fell in all portions of the State. The fall work was practically completed. Winter wheat and rye continued in fine condition and fall pastures held out unusually well. Stock was reported to be in good condition for the winter.—*H. B. Hersey.*

North Carolina.—The mean temperature for the State was slightly above normal, but the precipitation was 2.48 inches below normal. The weather was very favorable for outside work, but too dry for the proper germination and growth of winter grains. On account of the droughty conditions a great deal of winter wheat was sown late and a large acreage remained to be sown, especially in the central district. Early sown wheat looked vigorous. Rye and oats were doing well.—*A. H. Thiessen.*

North Dakota.—The month was quite warm and pleasant, until the latter part, when a severe snow and wind storm prevailed, accompanied by a moderate cold wave. Considerable fall plowing was done, especially in the northern and eastern portions. Stock on the ranges did very well.

SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS, NOVEMBER, 1905.

In the following table are given, for the various sections of the Climate and Crop Service of the Weather Bureau, the average temperature and rainfall, the stations reporting the highest and lowest temperatures with dates of occurrence, the stations reporting greatest and least monthly precipitation, and other data, as indicated by the several headings.

The mean temperatures for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperature and precipitation are based only on records from stations that have ten or more years of observation. Of course the number of such records is smaller than the total number of stations.

Section.	Temperature—in degrees Fahrenheit.							Precipitation—in inches and hundredths.					
	Section average.	Departure from the normal.	Monthly extremes. Station.	Highest.	Date.	Station.	Lowest.	Date.	Section average.	Departure from the normal.	Greatest monthly. Station.	Amount.	Least monthly. Station.	Amount.
Alabama	55.8	+ 2.4	3 stations	88	3 dates	Riverton	20	29	1.78	—1.38	Spring Hill	4.64	Thomasville	0.55
						Delmar, Valley Head	20	30						
Arizona	52.7	— 1.0	2 stations	92	1,2	Flagstaff	— 8	29	5.22	+3.99	Huachua Reservoir	14.25	Upper San Pedro	1.75
Arkansas	53.2	+ 2.1	Pocahontas	88	18	Oregon	9	30	3.28	—0.30	Marked Tree	6.23	La Crosse	0.88
California	52.0	— 0.8	Craftonville	96	2	Bodie	— 9	26	2.26	—0.51	Cuyamaca	10.15	Mammoth Tank	T.
Colorado	37.4	+ 2.4	Lamar	82	14	Wagon Wheel Gap	—27	29	0.77	+0.09	Silverton	5.81	Fort Morgan	T.
			Holly	82	15									
Florida	66.0	+ 0.7	Flamingo	91	7	Molino	31	12	0.91	—1.26	Miami	3.65	3 stations	0.00
Georgia	35.5	+ 1.4	Fleming	90	6	Diamond	18	23	1.69	—1.13	Montezuma	2.63	Valdosta	0.25
Hawaii	†71.9		Kohala Mission	91	21, 23	Humuula	41	5 dates	†10.28		Hakalau (Mauka)	46.18	Kihei, Maui	0.02
Idaho	35.6		Glenns Ferry	84	3	Lake	—12	21	1.46		2 stations	3.50	Garnet	0.31
Illinois	42.2	+ 1.4	Carrollton, Chester	79	28	Zion	4	30	2.14	—0.48	Raum	4.34	Philo	1.01
Indiana	41.7	+ 0.4	Veedersburg	78	28	Logansport	12	15	2.68	—0.94	Rome	5.53	Valparaiso	1.15
Iowa	38.4	+ 3.2	4 stations	70	4 dates	Estherville	—12	30	2.84	+1.53	Plover	5.30	Mount Vernon	0.90
Kansas	45.9	+ 3.1	Cunningham	81	13	Harrison	4	30	2.41	—1.38	Chapman	4.05	Oberlin	0.65
Kentucky	46.4	+ 0.6	Cadiz	79	18	Owenton	14	30	3.55	—0.25	Marion	6.44	Williamsburg	1.30
Louisiana	61.6	+ 3.6	Franklin	87	5	Calhoun, Ruston	26	30	4.88	+1.17	Grand Coteau	9.67	Shreveport	2.93
			Schriever	87	5, 27									
Maryland and Delaware	43.3	— 0.8	College Park, Md	77	25	Deer Park, Md	10	15	1.28	—1.57	Oakland, Md	3.40	Westernport, Md	0.16
Michigan	35.1	— 0.4	Charlotte	74	28	Detour	—16	30	2.19	—0.21	Hagar	4.61	St. James	0.69
Minnesota	33.1	+ 4.3	Redwing	71	12	Wadena	—35	30	2.64	+1.52	New Richland	4.63	Reeds Landing	0.96
Mississippi	57.3	+ 2.8	Leakesville	86	19	Ripley	17	30	3.20	—0.12	Woodville	7.34	Okolona	0.90
Missouri	45.8	+ 2.6	Decaturville	83	28	Unionville	2	30	1.94	—0.29	Fairport	3.58	Decaturville	0.65
Montana	33.3	+ 2.1	Lewistown	81	13	Fort Logan	—33	28	1.02	—0.05	Marysville	3.70	Fallon	0.05
Nebraska	40.4	+ 4.2	Grant	81	14	Halsey	—17	29	1.53	+0.89	Wisner	4.15	Kimball	T.
Nevada	36.4	— 3.1	Fenelon	88	14	Potts	—10	29	1.11	+0.32	Morey	2.88	2 stations	0.10
New England*	36.2	— 2.4	Madison, Me	69	2	Enosburg Falls, Vt	— 6	14	2.60	—1.58	Bar Harbor, Me	7.22	Norfolk, Mass	1.30
New Jersey	42.1	— 1.3	Toms River	70	24	Charlotteburg	6	15	1.84	—1.87	Newton	2.86	Cape May	0.54
			Cape May C. H	70	24									
New Mexico	44.0	+ 1.4	Albert, Carlsbad	80	7	Tres Piedras	— 6	29	3.05	+2.56	Luna	6.01	Artesia	1.31
New York	35.6	— 1.5	Oyster Bay	77	2	Indian Lake	—10	30	2.19	—0.80	Ripley	5.40	Romulus	0.45
						North Lake	—10	3 d't's						
North Carolina	49.9	+ 0.2	Pinehurst	81	29	Pink Beds	5	22	0.72	—2.48	Murphy	2.60	2 stations	0.00
North Dakota	31.6	+ 8.6	Medora	88	16	Walhalla	—38	30	1.54	+0.66	Hamilton	3.06	Williston	0.31
Ohio	39.6	— 1.4	Chillicothe	71	24	Green Hill	10	14	2.63	—0.50	Green	4.34	Bellefontaine	1.47
			Ironton	71	18	Millport	10	14						
Oklahoma and Indian Territories.	51.9	+ 2.5	Fort Sill, Okla	86	1	Vinita, Ind. T	9	30	2.59	+0.30	Harrington, Okla	5.29	Meeker, Okla	0.30
Oregon	41.4	— 1.8	Fairview	81	11	Richland	3	18	2.98	—3.81	Orseco	9.13	Warmspring	0.17
Pennsylvania	39.1	— 1.1	Irwin	68	29	Pocono Lake	5	14	2.47	—0.77	Brookville	3.72	Dushore	1.08
			Philadelphia (c)	68	6									
Porto Rico	77.6		Central Aguirre	98	7	Adjuntas	53	20	7.41		Lares	14.66	Ponce	2.90
South Carolina	54.5	+ 1.4	Gaffney	90	26	Greenville	21	23, 24	1.31	—1.53	Liberty	2.41	St. George	0.00
						Seivern	21	22						
South Dakota	37.1	+ 6.0	Armour, Mellette	76	16	Ipswich	—27	30	1.60	+1.09	Elk Point	3.90	Pine Ridge	0.30
Tennessee	49.6	+ 1.7	Dover	80	18	Hohenwald	17	30	1.94	—1.84	Trenton	5.47	Jonesboro	0.23
Texas	59.6	+ 2.7	Fort Ringgold	96	5, 19	Texline	14	30	3.62	+1.15	Danevang	10.60	Llano	0.05
Utah	37.9	— 0.3	Green River	79	26	Henefer	—11	29	1.53	+0.43	Tropic	4.97	Lucin	0.10
Virginia	46.5	— 1.2	Saxe	79	18	Dinwiddie	8	10	0.78	—1.71	Speers Ferry	1.90	Quantico	T.
Washington	40.1	— 0.2	Kosmos	74	8	Cusick	— 5	28	2.38	—2.94	Clearwater	9.30	Sunnyside	0.22
West Virginia	41.8	— 0.9	Moorefield	74	28	Bayard	10	21	2.44	— 0.60	Cairo	5.67	Elkhorn	0.67
Wisconsin	34.4	+ 2.8	Ashland	67	11	Grantsburg	—24	30	2.04	+0.52	Mount Horeb	3.25	Medford	0.65
Wyoming	32.5	+ 0.9	Pine Bluff	74	14, 16	Griggs	—26	29	0.60	+0.05	Fort Washakie	2.34	2 stations	T.

* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. † 47 Stations with an average elevation of 680 feet. ‡ 140 Stations.

Prairie fires during the month destroyed considerable grass on the ranges.—*B. H. Bronson.*

Ohio.—The weather was generally favorable for farm work and crops. Corn husking was well advanced and prospects were generally excellent. Winter wheat made splendid growth and the condition was unusually good. Rye was also reported to be in good condition, although there were a few reports of damage by fly to both wheat and rye. Pastures and meadows were in good condition. - *J. Warren Smith.*

Oklahoma and Indian Territories.—A warm month, with ample moisture. Fall plowing and seeding progressed well. Wheat did well. Late planted attained a good stand; early planted was making good growth, some stooling, some being pastured. Corn being cribbed in good condition, with fair to good yields. Cotton picking completed in some sections and about 75 per cent gathered in others; the quality was good. Good crops of kaffir corn, millet, sorghum, alfalfa, and hay were secured. Sweet potatoes were a good crop. Irish potatoes fair. Pastures good; stock doing well.—*Edward B. Richards.*

Oregon.—The month was very favorable for farm work; sufficient rain fell to put the soil in excellent condition for plowing and seeding, and a large acreage of wheat land was seeded. Wheat sown the latter part of October and the early part of November came up quickly and looked thrifty and promising, while that sown later germinated slowly, owing to cool weather and frosty nights. The growth of grass was also checked during the last decade, and stock began losing flesh and required extra feeding.—*A. B. Wollaber.*

Pennsylvania.—Soil in good condition. Farm work well advanced. Winter grain well set and thrifty; a few reports of fly. Streams, springs, and wells were filled by the copious rains of the 28th and 29th, relieving the danger of water famine.—*T. F. Townsend.*

Porto Rico.—Rainfall generally light until near the close of the month, when heavy to excessive showers occurred in all sections. Cane did well generally and a large sugar crop seemed assured; the crop arrowed freely in the northern districts; in the south considerable cane was matured and ready for the December grinding. Coffee picking continued in the highlands. There was a great increase in the acreage of tobacco sown this year and planting continued active: the crop was in good condition at the close of the month. Much of the cotton crop was destroyed by worms. Oranges were plentiful; small crops somewhat scarce.—*E. C. Thompson.*

South Carolina.—The month was warmer than usual; there were frequent frosts, but crops were beyond damage. There was less than the usual amount of precipitation, which caused a scarcity of water in some localities. The drought also interfered somewhat with oat and wheat seeding, which was not finished. Early sown wheat and oats germi-

nated favorably and came up to good stands. Harvesting operations were finished. Truck suffered for rain, but was nevertheless in fair condition.—*J. W. Bauer.*

South Dakota.—Month warmer and wetter than usual. Rain and snow retarded cribbing of corn, and considerable corn was yet in fields on the 30th. Some corn showed slight damage by worms. Winter grains and also live stock were in fine condition. Weather was favorable for free grazing of stock on ranges, except during the last four days of the month, when there was a rain and snow storm followed by low temperatures, and from six to twelve inches of snowfall over the northern counties. Considerable plowing was done.—*S. W. Glenn.*

Tennessee.—The precipitation was light until the 28th and 29th, when good rains fell generally over the State, with heavy amounts in the northwest portion. The rainfall was sufficient for the needs of winter grains, and temperature and sunshine conditions were also favorable, so that wheat and oats were in fine condition. Corn, cotton, and peanuts were nearly all gathered by the close of the month, and farm work was well advanced.—*Roscoe Nunn.*

Texas.—Moderate temperatures prevailed during November, and there was little damage by frost. Good showers were well distributed throughout the month. Seeding winter grain was somewhat delayed, but conditions were favorable for germination and growth. Cotton picking delayed; 10 to 20 per cent to be picked northeast, but mostly picked farther south; boll weevil numerous; cattle turned into some fields. Rice thrashing almost completed. Cutting and grinding of cane in progress. Pastures and conditions for truck gardening improved. Cattle doing well.—*M. E. Blystone.*

Utah.—Warm, pleasant weather prevailed during the first two decades, followed by a stormy period near the close of the month, during which several inches of snow fell. Farm work advanced rapidly, and the sowing of wheat and rye was practically completed; an increase was reported in the acreage sown to winter wheat. Considerable plowing for spring grain was done. The gathering of beets and potatoes was completed. The range was good, though generally covered with snow. Stock was thriving.—*L. Lodholz.*

Virginia.—The cold and dry weather of the month in middle and tidewater Virginia was not favorable for crops, and, except locally, germination of late seeding of wheat, oats, and clover was much retarded, and the stands secured were not as good as usual. Growth of early seeding was also checked. In the great valley division, where the quantity of precipitation was greater than elsewhere in the State, and the distribution quite uniform, crop progress, both of early and late seeding, was better and the general situation was more advanced at the close of the month.—*Edward A. Evans.*

Washington.—Absence of rainy weather afforded opportunity to complete winter wheat sowing and fall plowing. Month was too cool and frosty for rapid germination or growth of wheat, but the crop was in fair condition and well covered by snow at the end of the month. The dry weather of the fore part of the month was unfavorable for pastures, but very favorable for gathering root crops and late apples.—*G. N. Salisbury.*

West Virginia.—Fine weather prevailed during the month and farm work progressed nicely. Wheat and rye made good growth and were looking well. A large acreage of wheat was sown. Pastures were in fairly good condition, and but little feeding was done. Stock was in good condition. Corn husking was nearing completion. Meadows and clover were in excellent condition. Some plowing was done for next year's crops.—*E. C. Vose.*

Wisconsin.—The month was mainly pleasant and favorable for completion of farm work. Winter wheat, rye, and grasses were in healthy condition and the snowfall over the central and northern counties in advance of the cold wave of the 29th furnished ample protection. The soil was generally well stored with moisture. The storm of the 29th was accompanied with very high winds and some damage to fences and wind mills occurred.—*W. M. Wilson.*

Wyoming.—The mild and pleasant weather of the first 25 days of the month was extremely favorable for the stock throughout the State, and the storm of the closing days of the month was not severe enough to seriously affect any of the stock. Ranges provided good feed and stock remained in good condition. A good supply of snow was accumulating in the mountains.—*W. S. Palmer.*

SPECIAL ARTICLES.

THE IMPORTANCE OF A WELL WRITTEN SYNOPSIS OF WEATHER CONDITIONS.

By N. R. TAYLOR, Observer, Weather Bureau. Dated Springfield, Mo., November 29, 1905.

The various meteorological elements shown on a weather map furnish at all times ample material for an interesting résumé of the general weather conditions that prevail over the territory covered by the Canadian, Mexican, West Indian, and United States stations reporting to the Weather Bureau. The space allowed on the weather map for the synopsis of general conditions is often too limited to fully express the different effects caused by the varied movements of the atmosphere.

Those who receive the weather maps are not only interested in the predictions that appear thereon, but some also desire to know the prevailing weather in particular regions other than their own; some, who have learned the meaning of the areas of high and low pressure, test their ability to forecast for themselves; and some study the observer's notes with a view to learning what it is all about. To the latter class belong the teachers and scholars of the hundreds of schools where weather maps are used in the course of study. The daily press of the country also belongs to this class, for the newspaper of to-day that does not contain some item from the weather map is indeed obscure and unimportant. Many newspapers, especially those published in the afternoon, not only use the forecast and tabulated matter, but print conspicuously the entire notes of the observer. A well written synopsis is always welcome "copy" to the newspaper reporter, who sees to it that it receives a place in his paper commensurate with its importance.

No better way can be imagined of teaching the public at least some of the principles which are involved in making weather predictions than an intelligently written summary of meteorological conditions. By reading such a summary the student of the weather map easily calls up a mental picture of prevailing atmospheric conditions throughout the country without the aid of the map itself.

A satisfactory synopsis ought to state as succinctly as possible, and in simple, but well chosen words, the prevailing weather conditions over the entire country covered by the weather reports, and the changes that have taken place since the issue of the preceding map. It should not only make plain to the ordinary reader the reasons for any changes that have occurred, but should show what connection exists between the prevailing weather and the forecast. In fact, a key to the forecast should always be found in the synopsis.

Of the many meteorological elements that are taken into consideration in the construction of a weather map, the most prominent are pressure, temperature, precipitation, and winds; and these, it is thought, should usually be discussed in the order in which they have been named. Areas of high or low pressure, when considered of sufficient importance to be referred to at all, should be commented on from day to day, and their effects on the weather in the different localities over which they pass should be noted so long as they appear on the map. By adopting this rule it will be found that new interest in the map will be awakened, and persons who once saw no meaning in the isobaric lines will find themselves watching the drifts of the crests and troughs of the great atmospheric waves. Marked changes in temperature should not be passed unnoticed, and the section of the country in which such changes have occurred should be referred to either in a general way, as the eastern or western half of the country, the Rocky Mountain regions, etc., or specifically when they have resulted in a degree of heat or cold sufficiently severe to injure agricultural products in any locality, as a hot wave in Texas, or a freeze in California or Florida. Precipitation, whether of rain, sleet, hail, or snow, is always an important element, and a synopsis would be incomplete that omitted the fact of its occurrence or failed to mention the section of the country from which it was reported. High winds are also an important feature in discussing the general weather conditions; they are especially important when reported from maritime stations, and their significance will be more generally understood if referred to as "dangerous gales," "winds of destructive force," or some other popular expression. Areas of clear, partly cloudy, or cloudy weather, when they are well defined